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Bicchieri, Cristina and Marini, Annalisa

University of Pennsylvania

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Cristina Bicchieri and Annalisa Marini
University of Pennsylvania

The paper studies the relationship between female genital mutilation/cutting (FGM/C) dynamics, social expectations and fundamentals across African countries. We show that socioeconomic conditions are overall worse in countries where FGM/C is practiced. Yet when we consider the dynamics of FGM/C within countries that perform it, there is no clear link between fundamentals and the decline of the practice. We find instead that FGM/C dynamics are strongly related to social expectations and social capital. Our findings have implications for policy interventions aimed at reducing FGM/C.

The world is rife with collective practices that are harmful, maladaptive and may violate human rights. Many of these practices involve women and girls, and a commonly invoked remedy is to guarantee them better access to education, health and employment (Toubia and Izett, 1998; Harrison, 1997). We focus here on female genital mutilation/cutting (FGM/C),[1] an old practice that has been extensively studied.[2] Many interventions aiming to reduce or eliminate female circumcision have been undertaken and are well documented (WHO, 2008; Shell-Duncan, 2008; Innocenti Insight, 2010; UNICEF, 2013; Shell-Duncan et al., 2013). Despite these interventions, though FGM/C has been reduced in some countries, it still persists in others and remains widespread in about 27 African countries, parts of the Middle East, the African diaspora worldwide.

It is often argued that the causes of the persistence and dynamics of FGM/C can be found in the social, political and economic conditions of the countries in which it is practiced (Easton et al., 2003; Williams and Sobiesczyk, 1997). Although the importance of economic conditions has been downplayed (Gruenbaum, 2001; Shell-Duncan, 2008), there are no studies linking all the

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[1] The term "female genital mutilation/cutting" is used by the World Health Organization to indicate "all procedures involving partial or total removal of the female external genitalia or other injury to the female genital organs for non-medical reasons" (WHO, 2008).

[2] Female circumcision was recognized in 1993 as a human right violation at the World Conference on Human Rights and after that various national laws and international resolutions against FGM/C have been adopted.

socio-economic-political fundamentals to FGM/C dynamics. We show that improvements in economic and socio-political conditions are not necessarily associated with a decrease or disappearance of FGM/C, especially when such practice is supported by shared social expectations. This is the case when FGM/C is a well-established tradition related to gender or group identity, to shared beliefs about beauty, health and cleanliness, or is otherwise supported by norms of purity, honor and fidelity. An analysis of 13 African countries also found that women who have undergone FGM/C are 40% more likely to get married (Wagner, 2013). Whenever cutting reflects social interdependencies, social expectations will matter. Such expectations can be empirical (what is commonly done) or normative (what the reference group believe one should do), and behavioural change is often accompanied by a change in social expectations (Bicchieri 2006, 2016). According to a recent study (UNICEF, 2013), FGM/C in most cases is either itself a social norm, or is supported by other norms and values, i.e., those who practice it have social expectations that support it. This view has been questioned by Efferson et al. (2015), who show that, in a study conducted in Sudan, cutting rates varied between and across communities, concluding that FGM/C cannot be modelled as a coordinating equilibrium (a convention). Though FGM/C may not coordinate marriageability within or across some communities, it might still be the case that those who practice it share other norms, beliefs and values that support cutting (as Efferson et al. also suggest). FGM/C may not be a coordinating convention, but it is often supported, for those who practice it, by social expectations, as our data show.

This paper provides a comprehensive study of the relationship between economic, political and social conditions and FGM/C stability or change over the period 1989 – 2011 across the 27 African countries in which FGM/C is still practiced.[3] In the first part of the paper, we present a preliminary and general analysis comparing the political and socio-economic conditions of African countries where FGM/C is practiced with those of African countries where it is not practiced. The second part of the paper specifically focuses on FGM/C dynamics in African countries where it is still practiced. We analyse the relation between FGM/C dynamics across time and the political and socio-economic characteristics of the country. We check whether there

[3] Other authors have analysed the effect of social interactions of FGM/C in Egypt (Naguib, 2012). Of those authors that have analysed a larger number of African countries, some have looked at micro-level factors such as reputation and identity pressures (Wagner, 2013), others (Bellemare et al., 2015) have used cross-country-year data to explain the persistence of FGM/C in a limited number of African countries.

are differences across countries that experienced increasing, decreasing or stable FGM/C between 1989 and 2011. We also examine the relation between FGM/C dynamics and social capital and the influence of social expectations about FGM/C on its prevalence across countries. The final section of the paper presents a case study. We select four countries as representative of those countries where FGM/C has either increased, decreased, remained stable and high or stable and low over time. In order to understand the factors that could explain such differences in FGM/C dynamics, we analyze the socio-economic conditions, the social expectations surrounding the practice, as well as the interventions implemented to eradicate it.

Our results do not support the common view that greater economic development and modernization will lead to the reduction or demise of such traditional practices. Instead, trust in institutions, active social participation and the role of social expectations appear to be major drivers of the weakening or elimination of FGM/C. The fact that social expectations, in the aggregate, play an important role in the permanence of FGM/C tells us that there are behaviour interdependencies. This does not mean FGM/C is a social norm or even a convention: it simply means that it is supported by shared values, norms and beliefs that may vary across communities. Our results provide suggestions about which policy interventions may be most effective in countries that still practice FGM/C.

To the best of our knowledge, this is the first attempt to present a general and comprehensive cross-country evidence on the relation between FGM/C, socio-economic-political data and social expectations.

In the next section we describe the theory and data of FGM/C dynamics. In section 2 we highlight the differences between African countries where FGM/C is not practiced and countries where it is practiced. Section 3 investigates the differences across African countries that still practice FGM/C by their FGM/C dynamics (stability or change), highlighting the importance of the relation between social expectations and FGM/C dynamics. Section 4 presents four case studies of representative countries that experienced either an increase, decrease, or stable high/low FGM/C. Section 5 presents our conclusions.

1 Theory and Data

1.1 Theory of FGM/C Dynamics

FGM/C is a general term that indicates various circumcision procedures that differ in both invasiveness and health risks. The type of practice varies depending on the place and tradition. Several reasons are evoked in support of the practice, ranging from tradition, cultural identity, cleanliness and beauty, preservation of virginity, preservation from promiscuity, better marriage prospects, even religious requirement (UNPF, 2015). Different individuals and groups may give some but not all and not even most of the above listed reasons. In groups that still extensively practice it, FGM/C is often so deeply rooted that everybody is expected to follow it: women must undergo FGM/C to be accepted by their community, and their families must support the practice to avoid the negative consequences that befall both the uncut girl and her family. It is important to note that in any country there may exist groups that practice FGM/C and groups that do not (Boyle, 2002; Dorkenoo, 1994). When talking about social expectations and sanctions we always refer to individuals and groups that adopt FGM/C. Individual actions and expectations should be contextualised accordingly.

Whether FGM/C is diagnosed as a traditional custom, a convention or a social norm, matters to decisions about how to intervene in order to curb the practice (Bicchieri, 2016).[4] If FGM/C is a custom based on beliefs about health, gender identity or ethnic markers, individual interventions aimed at changing such beliefs or providing alternatives might be sufficient. If instead FGM/C is a convention or a social norm, it can be modelled as an equilibrium within the specific group that practices it. In both a convention and a social norm, individual preferences are conditional on the expectations about the behaviour of their reference group (Bicchieri, 2006). If the practice is a convention, the only expectations that matter to choice are empirical ones, i.e. the beliefs about the typical behaviour of one's reference group. In this case, an individual or family may simply want to 'coordinate' with the common behaviour of their reference group because of a variety of reasons (that may or may not include marriageability (Efferson et al., 2015)). If instead the practice is a social norm, empirical expectations are always complemented by normative ones, i.e. individuals believe that their reference group expects them

[4]For the difference between customs, conventions and social norms see Bicchieri, 2006 chapter 1 and Bicchieri, 2016 chapter 1. Briefly, a custom is followed independently of social expectations, a convention is followed because of the presence of relevant empirical expectation and a social norm is followed because both empirical and normative expectations are present.

to behave in a particular way, and might punish them if they do not. In the case of a convention, deviating from equilibrium only penalises the deviant. For example, an uncut girl may be seen as less beautiful within her extended family or group, but without major social consequences. In fact, in many countries families who practice FGM/C and families who do not intermarry. In the case of a social norm, the equilibrium is supported by the sanctions that deviations would bring about. For example, if FGM/C is related to the importance of virginity and fidelity, an uncut girl may be seen as a worse marriage prospect, with serious negative consequences for her and her family. Sanctions are often necessary when deviations from a particular collective behaviour create a negative externality, such as with behaviours that symbolize a group's identity. In this case, FGM/C may relate to a tradition that strongly identifies a specific group or ethnicity.

If some collective practices are equilibria, then they can only be endogeneously changed collectively, since an individual, isolated deviation will face a cost (personal and/or social) and a very low probability of success. Once a norm is established in a group, beliefs will be self-fulfilling and the norm will be self-reinforcing (Bicchieri, 2006), producing social traps (Brock and Durlauf, 2001, 2006; Zanella 2007)). Only when many members of one's reference group change behaviour, the risk of being sanctioned declines and a social norm loosens its grip (Bicchieri and Mercier, 2014, Bicchieri, 2016). A policy aimed at changing social expectations is likely, if successful, to lead a society out of a social trap.

This general theoretical framework is supported by reports and data on FGM/C (UNICEF, 2013). However, the factors that determine FGM/C dynamics may vary depending on the country or region under study. It could well be, for instance, that in some cases FGM/C is more of a shared custom than a social norm, while in others it is a social norm proper, in that both normative and empirical expectations are present and have a causal influence on behaviour. It is important to bear this in mind when interpreting the results.

1.2 The Data

The data span from 1989 till 2011, the time range for which we have available data on FGM/C. The data are drawn from various data sets. In particular, to obtain time series data for FGM/C at the country level, we used the UNICEF 2013 report, the UNICEF country-specific 2014 reports (that gather information from both the Multiple Indicators Cluster Survey [MICS] and the Demographic and Health Surveys [DHS] to obtain FGM/C dynamics over time) and the DHS data sets. The DHS data sets are collected from several countries, including African ones,

and contain information on demographics and health status of representative samples of women. The DHS surveys also collect information on FGM/C of mothers and daughters, the beliefs of responders about the practice of FGM/C and the necessity to continue it, and beliefs about why FGM/C is still adopted in the country in which the responder is living.

To get a complete picture of the economic, social and institutional differences across African countries that practice FGM/C and African countries that do not, as well as to analyze correlations existing between fundamentals and FGM/C dynamics, we used indicators from various international data sets. From the World Development Indicators (WDI hereafter), we selected the following: agriculture value added, industry value added, manufacturing value added and services value added as percentages of GDP, as well as GDP per capita, indicators for female education as well as the role of females in tertiary education.

From the Heritage Foundation, which contains a series of country-specific indicators of the level of various freedoms in each country and provides data from 1995 to 2011, we selected two indicators: the overall score of freedom in a country and the indicator of freedom from corruption. To check for differences in both civil liberties and political rights, we used the two indicators from the Freedom House data set. We also used the CIRI data set, which collects country-specific indicators measuring socio-political freedoms. The indicators collected from this data set are as follows: a measure of physical integrity, empowerment rights index, freedom of association and three indicators for women economic, political and social rights. Finally, from the PolityIV data set we use the indicators *polity2* and *polcomp*, which measure, respectively, a country level of autocracy versus democracy and its degree of political competition.

To check whether differences in individual freedom exist across the countries under study, we collected information from the World Values Survey (WVS hereafter) data set. The WVS is made with 6 waves covering the years 1981-1984 (Wave 1), 1989-1993 (Wave 2), 1994-1999 (Wave 3), 1999-2004 (Wave 4), 2005-2009 (Wave 5) and 2010-2014 (Wave 6). Because information on FGM/C is only available since the late 1980s, we only used Waves 2-6. For the majority of countries information is available only for the last three waves. From WVS, we select a variable already used by the literature to capture individual autonomy (e.g. Tabellini, 2010; Bavetta and Navarra, 2012). Details about the construction of the variable are described in the Appendix.

We also used the Afrobarometer to obtain aggregate social indicators and their evolution across countries with FGM/C. This data set is made up of 5 rounds and covers the period 2000-2011/2013. The Afrobarometer contains several questions on generalized and personalized trust, trust in institutions, membership in social groups, and the way women should be treated.

Finally, the index of ethnic fractionalization is taken from Alesina et al. (2003).

For some of the data sets, the list of African countries is complete, for other data sets (especially survey data), the list of countries is large but incomplete. However, these country lists are representative of countries with FGM/C as well as countries without FGM/C. Moreover, the data are also representative of within-county differences in the practice of FGM/C, i.e., countries where the practice is widespread as well as countries where the practice is only adopted by a small percentage of individuals. The overall data, across and within countries, allows to draw robust conclusions about the drivers of FGM/C and its dynamics.

The countries we use in our analysis as well as the variables, their definition and source are listed respectively in Table A1 and Table A2 of the Appendix.

2 Africa: a Comparison of countries with and without FGM/C

In this section we look at differences in the social, political and economic conditions between African countries that practice FGM/C and African countries that do not practice it. We only consider cross-country data and do not differentiate the within-country distribution of FGM/C in countries that practice it.

2.1 Macroeconomic and Socio-Political Data

In Table 1 and 2 we report the descriptive statistics for relevant indicators taken from several macroeconomic and socio-political data sets for, respectively, African countries with and without FGM/C. The data clearly show that the countries where FGM/C is not practiced are better off than countries where FGM/C is a common practice. Countries where FGM/C is practiced have a higher value added as percentage of GDP only for the agricultural sector. This indicates that countries with FGM/C are more rural and less developed than countries with no FGM/C. The indicators for schooling and literacy rate show that in countries where FGM/C is practiced the literacy rate of both young and adult females is lower than in countries with no FGM/C. The literacy rate of young females is higher than the literacy rate of adult females for both sets of countries, indicating that literacy of females is growing over time regardless of whether FGM/C

is practiced. In addition, for both sets of countries we found a very small percentage of female teachers in tertiary education. Once again the percentage is lower in the countries where FGM/C is adopted.

Table 1: Fundamentals for African Countries with FGM/C

	FGM/C				
	World Development Indicators				
Variable	**Observations**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Service VA***	575	43.97	12.64	4.14	82.26
Industry VA***	575	22.01	10.19	1.88	54.97
Manufacture VA***	556	8.75	4.61	0.24	22.30
Agriculture VA***	577	34.80	14.64	3.06	93.98
GDPpc***	598	502.69	274.29	50.04	1551.25
literacy yF***	460	50.17	21.33	6.90	96.06
literacy aF***	471	33.45	17.22	2.29	81.04
TertiaryFemaleTeachers***	386	12.31	6.77	1.23	43.93
	Heritage Foundation Freedom Indexes				
Overall	412	52.91	6.52	26.00	70.19
Freedom Corruption***	417	24.37	10.56	7.00	70.00
	Freedom House				
Political Rights***	617	5.06	1.59	1.00	7.00
Civil Liberties***	617	4.73	1.30	2.00	7.00
	CIRI				
Physical Integrity***	598	3.87	1.96	0.00	8.00
Empowerment Rights***	598	6.58	2.99	0.00	14.00
Freedom Association***	598	0.77	0.72	0.00	2.00
Women's Economic Rights***	598	0.88	0.50	0.00	2.00
Women's Political Rights***	598	1.72	0.53	0.00	3.00
Women's Social Rights***	596	0.68	0.53	0.00	2.00
	Polity IV				
polity2***	617	-0.92	4.84	-9.00	8.00
political competition***	596	5.02	2.73	1.00	10.00

Note : *** indicates ignificance at the 1% according to the Wilcoxon-Mann-Withney test.
Source : World Development Indicators, Heritage Foundation, Freedom House, CIRI, PolityIV. Years 1989-2011.

With regards to the indicators taken from the Heritage Foundation, Freedom House and the CIRI data sets, the countries with or without FGM/C do not significantly differ in terms of overall freedom. However, countries with no FGM/C have significantly higher rates of freedom from corruption. Protection of both civil liberties and political rights is higher in countries

without FGM/C (for these indicators lower values indicate higher freedoms) and the averages are significantly different for the two sets of countries.

Table 2: Fundamentals for African Countries without FGM

	NO FGM/C				
	World Development Indicators				
Variable	**Observations**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Service VA***	568	48.99	14.41	3.64	87.76
Industry VA***	561	33.17	16.79	5.38	80.59
Manufacture VA***	536	13.24	8.26	1.72	45.67
Agriculture VA***	561	17.76	13.69	1.16	57.22
GDPpc***	587	2592.88	2961.06	143.04	15098.62
literacy yF***	539	82.16	16.65	30.50	99.83
literacy aF***	535	65.97	17.30	18.93	96.72
TertiaryFemaleTeachers***	379	24.82	13.10	4.96	55.23
Overall	405	52.55	10.74	21.40	76.30
Freedom Corruption***	405	31.19	14.73	10.00	70.00
	Freedom House				
Political Rights***	598	4.43	2.04	1.00	7.00
Civil Liberties***	598	4.24	1.55	1.00	7.00
	CIRI				
Physical Integrity***	563	4.39	2.19	0.00	8.00
Empowerment Rights***	563	7.47	3.61	0.00	14.00
Freedom Association***	563	1.00	0.82	0.00	2.00
Women's Economic Rights***	563	1.09	0.52	0.00	3.00
Women's Political Rights***	563	1.92	0.52	0.00	3.00
Women's Social Rights***	563	0.80	0.67	0.00	3.00
	Polity IV				
polity2***	552	0.54	6.26	-10.00	10.00
political competition***	552	5.56	3.16	1.00	10.00

Note: *** indicates ignificance at the 1% according to the Wilcoxon-Mann-Withney statistic.

Source : World Development Indicators, Heritage Foundation, Freedom House, CIRI, PolityIV. Years 1989-2011.

The social indicators collected from the CIRI data set indicate that physical integrity, empowerment rights, freedom of association and women's political economic and social rights are higher in countries where FGM/C is not practiced. The result for freedom of association is

consistent with the findings of the UNICEF report on FGM/C (UNICEF, 2013), according to which FGM/C is a persistent practice wherever individuals do not talk about it and therefore do not share their opinions, nor do they have avenues for meeting and sharing their views.

Finally, the descriptive statistics for the two indicators collected from the Polity IV data set, a measure of the degree of democracy versus autocracy and a measure of political competition across the two sets of countries, show that, overall, both countries with and without FGM/C enjoy a low degree of political competition and low levels of democracy. Yet, once again, on average the political framework is slightly better for countries where FGM/C is not practiced than for those where FGM/C is practiced.

The differences in macroeconomic, social and political indicators between the two sets of countries are likely to be correlated with individual autonomy. Previous studies and data show that in less developed countries (e.g. countries with lower GDP per capita and lower growth rates) individuals are less autonomous (Tabellini, 2010). It has been pointed out that lower degrees of motivation, more passive attitudes and less perceived self-efficacy (all variables related to lower autonomy) can lower individual productivity as well as macroeconomic performance (Tabellini, 2010; Bavetta and Navarra, 2012). Moreover, higher levels of autonomy have been shown to correlate with higher level of social capital, greater economic development and better governance (Tabellini, 2008, 2010).

To assess autonomy, the WVS asks the following question: "*Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Please use a ten point scale in which 1 means "none at all", and 10 means "a great deal" to indicate how much freedom of choice and control you have over the ways your life turns out*." We derive an indicator (*autonomy*) taking value 1 if the individual chooses a point of the scale greater than 5, and 0 otherwise. To look for correlations between autonomy and social capital, we use the WVS data and compare individual autonomy and social capital between the African countries that practice and those that do not practice FGM/C.

Table 3: Autonomy, FGM/C and Social Capital Correlations

Variable	Autonomy	FGM_rate	trust	trustKnown	localComm	worldCitizen	trustOtherN	trustOtherR
autonomy	1.00***							
FGM_rate	-0.14***	1.00***						
trust	-0.02***	0.10***	1.00***					
trustKnown	0.00	0.15***	0.11***	1.00***				
local_community	0.03***	0.02***	0.01	0.04***	1.00***			
worldCitizen	0.07***	-0.13***	0.01**	-0.08***	0.21***	1.00***		
trustOtherN	0.07***	-0.03***	0.08***	0.14***	0.04***	0.13***	1.00***	
trustOtherR	0.07***	0.02***	0.06***	0.14***	0.04***	0.12***	0.60***	1.00***

Note : Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.

Table 3 reports the correlation coefficients between individual autonomy (*autonomy*), the rate of FGM/C (*FGM_rate*) in the country and other variables capturing the social capital and openness to diversity for each country. The results show that the rate of FGM/C is negatively and significantly correlated with individual autonomy. The FGM/C rates (*FGM_rate*) are positively and significantly correlated with the indicators for generalized and personalized trust (*trust* and *trustKnown*, respectively) and with sociability (*localComm*). They are negatively correlated with individuals' openness (whether one feels to be a citizen of the world and whether one trusts individuals from different countries, respectively *worldCitizen* and *trustOtherN*).

Individual autonomy is not only negatively correlated with FGM/C rates; it is also negatively correlated with generalized trust and positively correlated with the variables capturing the degree of openness and sociability of the individuals (namely, individual feelings of being a citizen of a local community or the world, and trust in other nations or religions). Though these correlations are mutually consistent, these results may seem *prima facie* odd. Greater autonomy should positively correlate with more, not less trust (Tabellini, 2010). Yet countries that practice FGM/C have low levels of autonomy and high levels of trust. This negative correlation may be due either to measurement problems, or to structural characteristics of the country (for example, high autonomy combined with high systemic corruption may lead to low trust).

The data indicate that individuals in countries with FGM/C tend to trust more individuals they personally know. Interestingly, the level of generalized trust is also increasing with *FGM_rate*, showing that generalized trust is higher where FGM/C rates are higher. The positive correlation between the rate of FGM/C and generalized trust may be explained by the fact that whenever a society abides by traditional practices the belief that most other society members also follow the tradition makes them trustworthy (unfortunately, there are no surveys measuring such beliefs).

Also consider that many areas where FGM/C is practiced are rural, and people rarely move away from their villages. In this case generalized trust may refer to the disposition to trust those one already knows. The fact that personalized and generalized trust may be confused in these settings demonstrates the need for a refinement of trust indicators (Yamagishi, 2011a,b). On the contrary, individuals living in countries with no FGM/C tend to see themselves as citizens of the world and are more open to individuals of other nationalities than people living in a country practicing FGM/C. Those countries, however, are usually characterized by greater urbanization and therefore a greater chance of meeting strangers. Interestingly, trust in individuals who practice other religions is positively correlated with FGM/C, indicating that the presence of individuals with different religious creeds is not a problem across countries that practice FGM/C. This may be explained by the presence of ethnic and religious fractionalization within such countries.

2.2 Autonomy

We now look at differences in individual autonomy between African countries that do and do not practice FGM/C by means of logit models (Table 4). We are aware of possible statistical problems (Allison, 1999) in comparing logit coefficients across groups so, as suggested by recent work (e.g. Triventi, 2013), we use Average Partial Effects to make such comparison. All the regressions include both country dummies and time dummies for waves 2 to 5 (period 1989-2009), leaving the last wave as a reference (years 2010-2014). Thus, we estimate the following equation:

$$autonomy = \beta_0 + \beta_1 X_i + \beta_2 fgm_{ic} + \eta_i + \xi_t + \varepsilon_i \quad (1)$$

where X_i represents individual characteristics (i.e. age, age squared, gender, dummy variables for either compulsory or tertiary level of education as maximum level of education obtained, dummies for marital status (i.e. single or married) a dummy indicating whether the individual has children, dummies for working status (i.e. full-time, part-time worker or self-employed) and the size of the city the individual is living in). *fgm* represents a dummy taking value 1 if the individual is living in a country that practices FGM/C and it is both individual (*i*) and country (*c*) specific; η_i indicates country dummies and ξ_t represents time dummies. *autonomy* is the dependent variable and ε_i represents the error term.

Table 4: Autonomy across African countries

Dependent Variable: autonomy	Whole Sample	FGM/C Countries	NO FGM/C Countries	FGM/C Women	FGM/C Men	NO FGM/C Women
	(1)	(2)	(3)	(4)	(5)	(6)
age	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
age^2	0.00*	0.00	0.00*	0.00	0.00	0.00
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
gender	-0.01	0.01	-0.02***			
	(0.007)	(0.011)	(0.008)			
eduH	0.04***	0.05***	0.04***	0.02	0.06***	0.05***
	(0.009)	(0.013)	(0.012)	(0.014)	(0.017)	(0.015)
eduL	-0.07***	-0.05***	-0.08***	-0.06***	-0.04***	-0.09***
	(0.009)	(0.014)	(0.012)	(0.019)	(0.014)	(0.012)
single	0.01	0.07***	-0.01	0.12***	0.01	-0.01
	(0.017)	(0.023)	(0.021)	(0.028)	(0.038)	(0.025)
married	0.02*	0.05**	0.01	0.08***	0.01	0.00
	(0.013)	(0.020)	(0.016)	(0.025)	(0.029)	(0.021)
child	0.01	0.02	0.01	0.05***	-0.01	0.00
	(0.010)	(0.014)	(0.014)	(0.025)	(0.020)	(0.015)
ft	0.04***	0.04***	0.04***	0.06***	0.04***	0.04***
	(0.008)	(0.011)	(0.010)	(0.019)	(0.014)	(0.014)
pt	0.02*	0.02	0.03*	0.03	0.02	0.02
	(0.013)	(0.024)	(0.015)	(0.026)	(0.034)	(0.018)
self-empl	0.03***	0.03**	0.03*	0.04	0.04**	-0.00
	(0.010)	(0.015)	(0.014)	(0.024)	(0.017)	(0.022)
CitySize	0.02**	-0.00	0.05***	0.00	-0.02	0.05**
	(0.011)	(0.013)	(0.017)	(0.015)	(0.018)	(0.022)
fgm	-0.21***					
	(0.040)					
country dummies	Yes	Yes	Yes	Yes	Yes	Yes
time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Log pseudo-Likelihood	-17,828.09	-8,464.65	-9,325.68	-4,012.93	-4,417.74	-4,721.86
Observations	31,047	14,653	16,394	6,861	7,792	8,139

Note : Estimation Method: Logit. Standard errors are robust to the heteroskedasticity and clustered by region. *p<0.10, **p<0.05, ***p<0.01

Source : UNICEF reports (2014) and World Values Survey. Years 1989-2014.

Model 1 (column 1) analyzes the probability of being an autonomous individual on the whole sample of African countries with and without FGM/C. In order to avoid simultaneity the dummy

for the practice of FGM/C (*fgm*) is constructed using the period preceding the reference wave of the survey. It could be argued that using both the FGM/C dummy variable and the country dummies as regressors could be problematic. However, we estimated the model with and without the FGM/C dummy and we also estimated a model that only accounts for the FGM/C dummy and excludes the country-dummies from the set of regressors. The results are statistically invariant, therefore we may conclude that both the sign and the significance of the effect of the dummy for FGM/C countries is correctly estimated.

The results in Model 1 show that individuals living in countries where FGM/C is practiced are less likely to be autonomous than individuals living in countries where FGM/C is not practiced. In general, individuals with at least some degree of tertiary education are more likely to be autonomous than individuals with intermediate education (reference group), while individuals with at most a compulsory level of education are significantly less likely to be autonomous than individuals with secondary education. Married individuals are more likely to experience a higher level of control over their own life than individuals that are neither married nor single (i.e. widowed, divorced). Individuals with a job (either employed full-time, part-time or self-employed) are overall more likely to be autonomous than individuals belonging to the reference category (students, retired, homemakers, unemployed, other). Individuals living in big cities are more likely to be autonomous than those living in small cities.

Models (2) and (3) report the regression results on, respectively, the sample of individuals living in a FGM/C country and individuals living in a country without FGM/C. Comparing columns 2 and 3, we observe that in both sets of countries individuals with higher (lower) education are significantly more (less) autonomous than individuals with intermediate levels of education (the reference group). Also, in both sets of countries, full-time or self-employed workers are more autonomous than individuals in the reference group (unemployed, students, retired, etc.).

There are, however, a few important differences between the two groups of countries. In countries without FGM/C, women are less likely to be autonomous than men, but this is not the case in countries with FGM/C. This may reflect the important role that women play in the family in more traditional societies. Where FGM/C is present, married individuals (of both sexes) or singles by choice are more autonomous than individuals that are widowed or divorced, and this is probably indicative of the importance of marital status in these countries.

Comparing women and men living in FGM/C countries (columns (4) and (5) respectively), we see that working full time increases the autonomy of both men and women. However, higher levels of education increase the autonomy of men, not of women: this highlights the low importance of higher education for women in these countries. Women who are married and have children are more autonomous, but marital and parental status do not influence men's autonomy. Overall, the results indicate that individual autonomy of women in countries that practice FGM/C is mainly influenced by their marital and parental condition, while higher levels of education and self-employment have a positive and significant impact on men's autonomy. This is consistent with the fact that in more traditional societies being unmarried or, if married, sterile have dire consequences for women.

Finally, model (6) reports the results for the sample of women living in African countries where FGM/C is not practiced. Comparing these results with those of women living in countries that practice FGM/C (column 4), we see that in non FGM/C countries higher levels of education correspond to higher autonomy. This result indicates that, on average, investing in higher education of women in these countries increases their autonomy. Also, marital and parental statuses are not relevant to women's autonomy unlike what happens in FGM/C practicing countries. We may conclude that the difference between more traditional countries where FGM/C is practiced and those that do not practice it is reflected in women's role in the family and society.

The data show that overall the macroeconomic, social and political conditions of countries without FGM/C are better than those of countries where FGM/C is practiced. Countries without FGM/C also show a greater level of individual autonomy and a wider set of roles women can take in society. Though our data show that more developed countries are less likely to practice FGM/C, we cannot infer that greater development will be accompanied by a *reduction* of FGM/C. In the next two sections we show that, within countries that practice FGM/C, those with better economic/social/political conditions do necessarily have the lowest rate of FGM/C, nor better success in curbing this practice over time.

3 FGM/C Dynamics

We focus now on African countries where FGM/C is practiced. First, we look at the relationship between the rate of FGM/C and socio-economic-political indicators; we then present

the correlation between FGM/C rates and social expectations, and conclude with four case studies.

3.1 Fundamentals and FGM/C Dynamics

Table 5 shows the correlation coefficients between the rate of FGM/C and social, political and macroeconomic indicators.[5] The 27 countries have been grouped into countries that experienced a decrease in the rate of FGM/C between 1989 and 2011 (column 1), countries that experienced an increase in FGM/C (column 2) and countries with stable levels of FGM/C (column 3).

Table 5: FGM/C and Fundamentals by FGM/C dynamics

	Decreasing FGM/C	Increasing FGM/C	Stable FGM/C
	(1)	(2)	(3)
Variables	FGM_rate	FGM_rate	FGM_rate
FGM_rate	1.00***	1.00***	1.00***
ServiceVA	0.27***	0.89***	-0.01
IndustryVA	-0.07	-0.32**	-0.06
ManufactureVA	-0.03	0.84***	-0.27***
AgricultureVA	-0.19**	0.10	0.04
GDPpc	-0.21***	-0.68***	0.09
LiteracyYF	0.06	-0.83***	-0.43***
LiteracyAF	0.03	-0.88***	-0.54***
TertiaryFT	-0.10	-0.90***	-0.27***
PhysIntegrity	-0.35***	0.66***	0.07
EmpowerRights	-0.29***	0.80***	-0.07
FreeAssociation	0.02	0.58***	-0.07
WEconomRights	0.13*	-0.06	0.16**
WPolRights	0.10	0.59***	-0.35***
WSocRights	0.42***	0.05	-0.09
PolRights	0.46***	-0.10	0.22***
CivLiberties	0.49***	-0.55***	0.28***
Polity2	-0.47***	-0.31**	-0.13*
PolComp	-0.42***	0.33**	-0.29***
OverallFreedom	-0.39***	0.39***	-0.34***
FreedomCorr	0.32**	0.03	-0.09
trust	-0.72***	0.98***	0.42***
trustKnown	0.28	0.84***	0.04

Note : Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.
Source : UNICEF reports (2014), World Development Indicators, CIRI, PolityIV, Heritage Foundation, Freedom House and Afrobarometer.Years 1989-2011.

[5] Note that indicators for political rights and civil liberties (*PolRights, CivLiberties*) are coded from 1 to 7, where 1 represents highest political rights and civil liberties and 7 the lowest. So a positive correlation indicates a negative relationship (see the Appendix).

As to correlations between FGM/C rates and economic indicators, we must conclude that whenever industrialization is increasing, FGM/C is decreasing, probably due to greater urbanization. Wherever GDP per capita increases, there is a tendency to lower FGM/C rates, but this is not always the case. Finally, especially for countries with increasing or stable rates of FGM/C, when women's literacy and their contribution to education as teachers in tertiary education increase, rates of FGM/C decrease.

The association between FGM/C and social rights (see Appendix for definitions) is not univocal. The same can be said for women's social, economic and political rights. There is, however, a positive association between political rights and civil liberties and decreasing FGM/C. In fact, the table also importantly shows that the higher the rate of democracy, the lower the FGM/C rates, meaning that living in a democratic country is negatively associated with the practice of FGM/C.

Finally, when we consider indicators for generalized and personalized trust, increasing FGM/C rates are positively correlated with personalized trust (*trustKnown*), indicating that the higher the trust in known people (e.g. family and friends), the higher FGM/C rates. This is reasonable, since the higher the trust in family and friends, the less a practice imposed by shared traditions is questioned. Moreover, wherever FGM/C is illegal, one must trust family and friends not to denounce the family that carries out the practice.

We also observe that in countries with decreasing FGM/C, the relationship between FGM/C and generalized trust (*trust*) is negative, i.e. as generalized trust increases, FGM/C decreases. This relationship instead is a positive and significant one in countries with either increasing or stable levels of FGM/C, i.e. as generalized trust increases, FGM/C increases. This paradoxical result could be explained by observing that most countries with stable or increasing FGM/C are predominantly rural. Where people do not often move away from their village and have little chance of meeting new people, generalized trust may be confused with personalized trust, and this is not captured by survey questions. These results are consistent with findings in section 2, where we look at trust across countries that practice/do not practice FGM/C.

In conclusion, Table 5 shows that, with the exception of a few important variables that have a strong and univocal relation with decreasing FGM/C, the FGM/C dynamics is not always univocally related to the socio-economic development of a country.

3.2 Is Social Capital Relevant?

In Table 6 we report the overall correlation coefficients between the rates of FGM/C and indicators of social capital taken from the Afrobarometer data set.

Table 6: FGM/C dynamics and Social Capital

Variables Labels	FGM/C_rate
FGM/C_rate	1.00***
trust	0.21*
trustKnown	0.10
trustPresident	-0.14
trustParliament	-0.17
trustPolice	-0.15
trustCourt	-0.42***
trustElecCommiss	-0.21**
trustLocalGov	-0.15
trustRulParty	-0.23**
MemReligiousGr	-0.50***
MemCommDev	0.36***
AttCommMeet	-0.46***
AttDemo	-0.26***
RaiseIssue	-0.49***
ContOfficial	-0.32***
ContInfluential	-0.35***
EmpowerW	-0.52***
WTreatedUn(Leader)	0.90***
WTreatedUn(Court/Police)	0.92***
WTreatedUn(Employer)	0.66***

Note: correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.

Source: UNICEF reports (2014) and Afrobarometer. Years 2000-2011.

The first rows of Table 6 confirm what we found in Table 5: rates of FGM/C are higher when both generalized and personalized trust are higher. Rates of FGM/C are lower when trust in government institutions (president, parliament, police, courts, electoral commission, local government and ruling party), is higher. In particular, the relationship is significant with trust in the court of law, trust in the national electoral commission and trust in the ruling party. Also, FGM/rates decrease with membership in religious groups. This finding is important because the

role of religious leaders in fostering abandonment of FGM/C has been often reported (UNICEF, 2013). Furthermore, while FGM/C rates increase with passive membership in local community groups, they decrease with an increase in social involvement and activism. These two results indicate that active participation is more beneficial than passive group membership for the elimination of bad practices. This is consistent with studies that find different effects of active and passive social capital (Beugelsdijk and van Schaik, 2005).

Finally, the stronger the belief that the government is empowering women, the lower the rate of FGM/C. FGM/C rates instead are higher when women are perceived to be unequally treated by a leader, an employer or institutions. Thus FGM/C is higher in countries where the perception that women receive an unequal treatment is widespread.

In sum, there are strong and meaningful correlations between the rate of FGM/C in a country and the level of social capital, helpful in explaining FGM/C dynamics.

3.3 Ethnic Fractionalization and Trust

Many African countries are characterized by ethnic fractionalization (Alesina et al., 2003). We might expect the relation between FGM/C and fractionalization to be negative, as different ethnic groups usually have different traditions, and FGM/C might be one of them.

Table 7: FGM/C, Ethnic Fractionalization and Trust: Correlations

Country Variables	FGM_rate	EthnicFract	trust
FGM_rate	1.00***		
EthnicFract	-0.28	1.00***	
trust	0.11	-0.25	1.00***

Note: Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.

Source: UNICEF reports (2014), Alesina et al., 2003 and Afrobarometer. Years 1989-2011.

In this case, we would expect FGM/C to be lower in more ethically heterogeneous countries. Also, we would expect the relation between generalized trust and ethnic fractionalization to be negative: Increasing heterogeneity, combined with strong group identification, may result in lower trust across different ethnic groups. This last consideration is in line with previous literature on the subject (Collier and Gunning, 1999; Alesina and La Ferrara, 2000, 2002, 2005; Bahry et al., 2005; Robinson2013a,b). Table 7 confirms that ethnic fractionalization and FGM/C

rates are negatively correlated, i.e., greater ethnic fractionalization corresponds to lower FGM/C rates. Another reason why fractionalization may decrease FGM/C rates is that, in cases where FGM/C is not a group identity marker (Shell-Duncan et al., 2011), within-country inter-ethnic coexistence may lower FGM/C rates. In Senegal, for example, there can be major variations in FGM prevalence among ethnic groups depending on the prevalent ethnicity of the region within which they live. (UNPF, 2015). We also find that the correlation between trust and ethnic fractionalization is negative.

3.4 Social Expectations Matter

Table 8 presents the correlations existing between rates of FGM/C and aggregate beliefs about FGM/C across practicing countries. The data for these correlations are taken from the DHS, where the women interviewed were asked whether they have been circumcised, their own beliefs (attitudes) about this practice, whether men want it to continue, and whether FGM/C is dictated by their religion.

Table 8: FGM/C and Beliefs: Correlations

Variable	circumcision	FGM_continue	b_Men_cont	FGM_req_Rel	trust	trustKnown
circumcision	1.00***					
FGM_continue	0.86***	1.00***				
b_Men_cont	0.91***	0.98***	1.00***			
FGM_req_Rel	0.90***	0.94***	0.93***	1.00***		
trust	0.13	-0.04	-0.30	-0.17	1.00***	
trustKnown	0.02	0.12	0.78*	0.38	-0.20	1.00***

Note: Correlation coefficients are reported. *p<0.10, **p<0.05, ***p<0.01.
Source: Demographic Health Surveys with information on FGM/C for available countries and Afrobarometer.Years 1989-2011.

For each country, we computed yearly averages (for each wave) of each variable to track the evolution of beliefs and FGM/C dynamics over time. The data are a representative sample of the countries practicing FGM/C. The table clearly shows that correlation coefficients between the rate of circumcision (*circumcision*) and the three beliefs (whether FGM/C should continue, if men/husbands want it to continue and whether it is required by religion) are large, positive and significant. This result is very important because it shows that the actual rate of FGM/C is highly correlated with positive beliefs about the practice. Thus empirical expectations (how frequent the practice is), personal beliefs and normative expectations (whether women believe that they

are expected by men and/or religion to engage in FGM/C) are important for the continuation of this practice. The correlation among the three beliefs is large, positive and strong, indicating that women who think that FGM/C should continue are also likely to think that men in general want FGM/C to continue and/or that FGM/C is required by religion. In sum, the whole table indicates that personal beliefs (attitudes), social expectations and the actual practice of FGM/C are very highly correlated. These factors seem to play a much larger role than the social, political and economic variables we have analyzed so far.

Note that these are country-level averages. Thus these results do not imply that – within a country or even a community – there is homogeneity of individual beliefs and expectations. Our results support the finding that countries with higher FGM/C rates have more favorable beliefs (attitudes) and consistent social expectations regarding the practice, but we should not infer from the data that FGM/C is a coordination norm.

4 Case Studies

We now analyze the relationship existing between FGM/C dynamics, interventions to stop the practice and economic-socio-political dynamics by choosing a country from four distinct groups (increasing, decreasing, stable/high and stable/low FGM/C). Our goal is to understand why a reduction of FGM/C has (has not) been achieved through policy interventions. Finally, using the DHS data, we estimate a social interaction model to investigate the impact of both social expectations and the practice's frequency on the probability to undergo circumcision.

4.1 FGM/C and Fundamentals

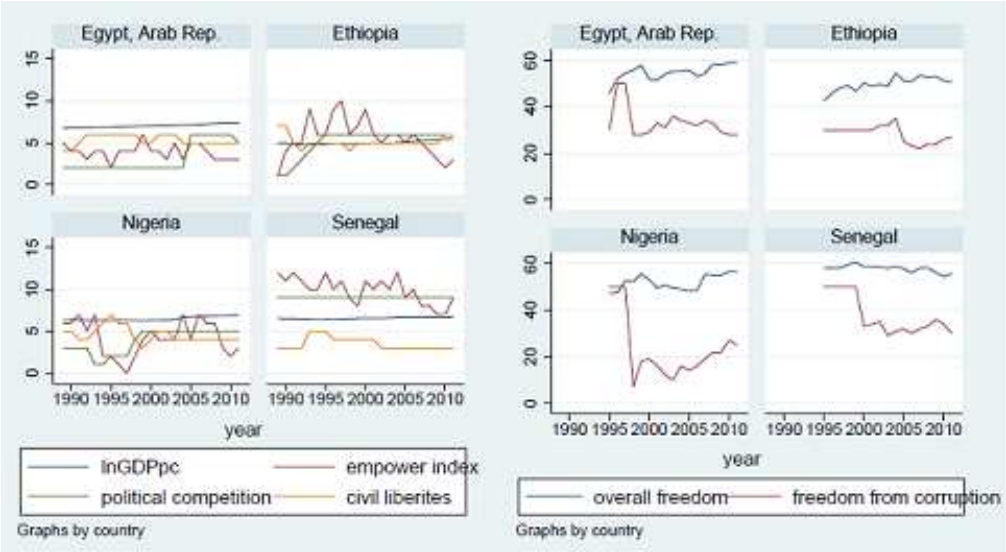
Figure 1 summarizes the socio-economic-political conditions of the four countries (Egypt, Ethiopia, Nigeria and Senegal) chosen for our case study. Egypt has an extremely high and stable FGM/C rate, Senegal has a stable, low rate, Ethiopia has a decreasing rate, and Nigeria has an increasing rate. We selected indexes that capture economic, social and political freedoms enjoyed by the countries.

Egypt is the country with the highest GDP per capita among the four countries considered,[6] showing that FGM/C does not depend on economic development. As to socio-political indicators, Senegal, followed by Egypt, is the country with the highest average level of overall

[6] We report the logarithm of the GDP per capita rather than the GDP per capita for the sake of graphical clarity.

freedom and freedom from corruption, although the graph shows that the trends for the two indicators of freedoms are similar across the four countries, and freedom from corruption is declining everywhere. Senegal has the highest average levels of political competition and empowerment rights, but once again no path can be detected between the dynamics of these indicators and FGM/C dynamics across the four countries. Finally, Egypt has the lowest average level of civil liberties, while Senegal has the highest average level.

Figure 1: FGM/C Dynamics and Fundamentals



Source: WDI, CIRI, PolityIV, Freedom House. Years 1989-2011.

In conclusion, there is no clear, univocal relationship between FGM/C dynamics and socioeconomic or political fundamentals, suggesting that FGM/C dynamics depend on other factors.

4.2 Interventions

In this section we review both legal and policy interventions across the four countries to detect the relationship (if any) between them and FGM/C dynamics over time.

4.2.1 Senegal

In Senegal the practice varies depending on the region and the ethnicity: according to the DHS data, in some regions it is quite widespread (e.g. Kolda and Zuguincho), while in others (e.g. Fatick and Louga) it is very low. Overall, the proportion of cutting is around 30% of the women population surveyed (UNICEF, 2013). Moreover, about 40 percent of Muslims and 14

percent of Christians still practice it. Senegal adopted a criminal law against FGM/C in 1999, and anyone who promotes or engages in the practice is subject to punishment, which may involve hard labour for life if cutting results in death (Shell-Duncan et al., 2013). Government programs aimed at abandoning FGM/C have been promoted since the 1970s, with the help of NGOs. However, these interventions have not been promoted homogeneously around the country. One successful approach has been implemented by Tostan (Gillespie and Melching, 2010). This is a community-led, holistic human rights-based program grounded on inclusive group discussion of rights, values and life perspectives (Antonazzo, 2003; Bicchieri and Mercier, 2014). The Tostan approach has been successful in the abandonment of FGM/C through the community-based, shared recognition of human rights (gender equality being one of them) and women empowerment. It has also been noted that favouring interethnic marriages in a country where the majority of the population does not practice FGM/C has independently helped to reduce the practice (Shell-Duncan et al., 2013).

4.2.2 Egypt

Egypt is one of the most interesting cases, as it is one of the most developed African countries, yet it is also one of the most resistant to abandon FGM/C.[7] The practice is a widespread "coming-of-age" tradition. Its endurance is due partly to a specific interpretation of the Muslim tradition, partly to the transmission of shared values and customs. Despite the health problems caused by FGM/C, it is considered a positive tradition (it is indeed called *tahara*, which means purification) and many women in Egypt are proud of being circumcised. Moreover, since the practice is well rooted in society, it is difficult for single families or women to behave unconventionally. If a family expects other families in their reference group to practice FGM/C and to believe that a family should circumcise its daughters, abandoning the practice can be socially costly (Bicchieri 2006, 2016). In Egypt, where family is very important and the head of the family is responsible for its members, FGM/C is generally thought as a moral commitment.

In the last decades, several interventions by the government and various NGOs have attempted to eradicate FGM/C in Egypt.[8] A law against FGM/C was adopted in 1996 and

[7] Though, as the EDHS data show, FGM/C has recently reduced among cohorts of young women, the overall rate is still very high.

[8] See the *Innocenti Insights* 2010 for a detailed and complete analysis.

amended in 2008, when the practice was criminalized. Punishment for violation is relatively mild, probably because FGM/C is socially accepted.

Country-level campaigns have been much less effective than other efforts implemented locally. This suggests that social interactions and individual expectations about the behaviour and beliefs of members of one's reference group are important in deciding whether to continue or abandon FGM/C. Women and their families may decide to abandon FGM/C when they see that people who matter to them abandon the practice, while they are not willing to act against FGM/C if they think that, despite media and governmental campaigns, people in their reference group will keep practicing it (Bicchieri, 2016). More studies are needed to understand the reasons why the practice is so widespread in one of the most developed African countries. If it is strongly supported by social norms of purity and chastity, for example, media and community interventions should aim at convincing individuals that purity and chastity can be attained without cutting (as Saleema did in Sudan (Bicchieri and Mercier, 2014)), if it is mainly religiously motivated, religious leaders should be engaged in the process of change, to name but a few interventions that will depend upon a better understanding of the reasons why FGM/C persists.

4.2.3 Ethiopia

Ethiopia is one of the countries where FGM/C rates are still high, but have declined over time. In this country, as in Egypt, chastity (before marriage) and marital fidelity of women are very important. This partly explains why FGM/C is still pervasive. However, the practice is declining due to the implementation of several policies around the country. The law is very thorough, and punishment is severe and can be extended to third parties who promote FGM/C.

Despite the presence of national laws, interventions against FGM/C have not been planned nationwide. Four interventions have taken place in the Amhara Region, the Wolayta Zone, the Afar region and the Kembatta region. Despite the fact that community involvement and community discussions were adopted in all four regions, a massive abandonment of FGM/C occurred only in the Afar and Kembatta regions (*Innocenti Insight* 2010). It is reported that in the Amhara Region individuals started to consider FGM/C as harmful, but this change of attitudes did not result in a change in behavior: FGM/C secretly continued and women who did not

undergo FGM/C were ridiculed and did not have an easy life in their community.[9] In Wolayta the result was similar, probably also due to the fact that local facilitators were trained at the regional level for a short time, and then were sent to villages to organize collective discussions that lasted only a few days. This dismal result could have had other reasons, too. It could for example be a consequence of the fact that individuals participating in collective discussions were taken from different villages and were later communicating the decision to abandon FGM/C to local communities without a previous local discussion. The change in attitudes, if at all sincere, was not perceived as shared by one's community. But it could also be the case that there was heterogeneity in community attitudes, so that there was a self-selection of those members who enlisted as discussion participants. More research is needed to assess these different reasons, and the benefits that communities attribute to cutting.

Also note that the two latter regions are prevalently Christian Orthodox (Amhara) or Protestant (Wolayta), so we cannot say that Islam was among the reasons for the persistence of FGM/C. On the contrary, in the Afar region (a prevalently Muslim region) and in the Kembatta Zone (an area with Christian traditions) the whole community was involved in the program. Local women and traditional religious leaders were trained as facilitators, and religious leaders spread the belief that Islam does not support cutting. These examples show that this practice is not mainly a matter of religion, since in Ethiopia a Muslim area abandoned it, but some Christian areas did not. The conclusion we can draw is that a "bottom up' approach based on changing the mind of a whole community rather than of single individuals seems to be a successful way to fight a well-rooted tradition such as FGM/C in this country.

4.2.4 Nigeria

In Nigeria, which is the country where FGM/C is increasing, little has been done so far to reduce it. Local laws were introduced in 1999. Only recently a national law against FGM/C has been approved (*Violence Against Persons (Prohibition) Act 2015*). FGM/C is now prohibited, but the punishment is not sufficiently severe to curb the practice. Besides, many studies show that the tension between an entrenched practice like FGM/C and a law that runs counter to it is not conducive to social change (Stuntz, 2000; Shell-Duncan et al., 2013). In many communities,

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traditional practices are not persecuted and, even though there exist laws against them, the police does not want to interfere with an enduring tradition (Platteau, 2000; Antonazzo, 2003).

In Nigeria, FGM/C is widespread among Christians; it is also practiced more frequently in families with higher education and upper-middle class city dwellers, indicating that this practice is considered something to be proud of in a country where gender inequality is still pervasive. Few efforts have been done to promote "bottom-up" approaches to address the perpetuation of FGM/C (Okeke et al., 2012; Odebode, 2014) and various sources (Immigration and Refugees Board of Canada, 2012) report that in Nigeria FGM/C is still practiced because it is supported by a variety of social norms, ethnic identity considerations, and status signalling. Odebode (2014) argues that although several efforts have been made to eliminate FGM/C in Nigeria, it still persists due to an inadequate analysis of the reasons of its permanence, and to the lack of programs aimed at changing attitudes as well as social expectations about the frequency and approval of the practice.

4.3 FGM/C Dynamics and Social Interactions

Since the data show that social expectations are related to the permanence of FGM/C, we introduce a social interaction model to test the probability of being circumcised as a function of social expectations.

Taking the findings in Table 8, we estimate the following social interaction model (e.g. Brock and Durlauf, 2001), using DHS data, on the whole sample of interviewed women in the four countries we analyzed:

$$\omega_i = c + \gamma_1 X_i + \gamma_2 Y_{ig} + J m_i^e + \varepsilon_i \qquad (2)$$

where ω_i is behaviour of individual i, that is, whether the woman has been circumcised. This is a function of a constant (c), individual characteristics X_i (represented here by age, age squared, a dummy that takes into account whether the woman is living in a rural or urban area, an indicator for education level and a dummy variable taking value 1 if the women is of Islamic religion). Y_{ig} indicates contextual-specific variables, represented here by geographic dummies. m_i^e is the social interaction term, and represents the region-specific rate of circumcision and women's empirical expectations about it (assumed to be correct for each i), as well as normative expectations, i.e.

the region-specific women's second-order belief about whether other women believe that FGM/C should continue (assumed to be correct for each *i*). Finally, ε_i is the error term.

The estimation results are presented in Table 9. The chosen variables capture the essential features that may influence the likelihood of being circumcised. As is conventionally done in social interaction models, we assume that individual expectations about average collective beliefs about m^e are obtained on the whole sample excluding the interviewed woman. Given the large sample, the sample average does not significantly differ from the averages obtained on the whole sample. This, together with the assumption of individuals' self-consistency, allows us to assume that individual expectations are equal to the objective probability generated by the model.[10] Both the average circumcision rates and normative expectations are yearly regional averages, for each country and wave. Regressions contain country dummies.

Table 9: Regression: Social Interactions Regression Model

	4 countries	
Dependent Variable: circumcised		
	(1)	**(2)**
age	0.01***	(0.001)
age2	-0.00***	(0.000)
urban	-0.01***	(0.002)
education	-0.02***	(0.001)
FGM_continue	0.03***	(0.007)
circumcision	0.61***	(0.004)
Islam	0.07***	(0.003)
Country Dummies	Yes	
Log pseudolikelihood	-47,811.91	
Obs	140,528	

Note : Estimation method: Logit. Column (1) reports the average partial effects at the mean. Standard errors, in parenthesis and reported in column (2), are robust to the heteroskedasticity.

Note : Demographic Health Surveys for Egypt, Ethiopia, Nigeria and Senegal.

[10] With regard to endogeneity problems (reflection and self-selection), our non-linear model overcomes the reflection problem (Manski 1993; Blume et al. 2011). The self-selection problem is usually a relevant one. However, in our case we have seen that individual mobility does not significantly decrease FGM/C even in immigrant communities. More generally, we can say that solving the self-selection problem would not significantly change our results.

The estimated model shows that both the regional average rate of circumcision and the regional average collective normative expectations about whether circumcision should continue have a positive and significant impact on the probability to be circumcised. This result supports the findings in Table 8, is valid for all the countries in our sample, and is consistent with our regional analyses. The model also shows that, *overall*, other variables have an impact on FGM/C. Older females are slightly more likely to be circumcised, and this reflects the overall tendency to reduce this practice among younger generations.[11] Living in an urban area as well as having higher education decrease the probability to be circumcised. Furthermore, Muslim women are more likely to be circumcised. Regional differences, however, exist on the influence of such variables on FGM/C, and we show it running separate regressions.

We estimate separate models on each of the four countries, to check for differences across them (results are available upon request). Regressions show that the impact of age, education and social expectations is similar across countries. Instead, the impact of living in an urban area is only positive and significant in Egypt, Ethiopia and Nigeria, indicating that women living in cities are slightly more likely to be circumcised; the opposite is true for women in Senegal. Finally, being a Muslim also shows cross-country variability, negatively affecting the probability to be circumcised in Nigeria and positively in the other three countries. We may conclude that while the impact of some variables is region and country-specific, the impact of social expectations is pervasive, positive and significant everywhere. This highlights the importance of acting on social expectations to reduce FGM/C in countries that still practice it.

5 Discussion and Conclusions

Female circumcision is a harmful practice that violates the rights of women and children and it is mostly illegally performed around the world. In some communities it may be supported by health beliefs or norms of purity and fidelity, in others it may be a necessary prerequisite for marriageability; it may represent a traditional custom that signals group identity, or it may mark the initiation into womanhood. More research is needed at the local level to assess the drivers of FGM/C. Thus, it is extremely difficult to draw a general picture and provide unique suggestions

[11] In the DHS surveys, interviewed women are asked if they have at least one daughter circumcised, or if they plan to circumcise their daughters. We do not use this information because this question is characterized by a high rate of item non-response. This may be due to reticence about a practice that is illegal in most countries surveyed.

to policy-makers. However, whatever the drivers might be, we showed that social expectations play a crucial role in supporting the continuation of this practice. This tells us that there are behaviour interdependencies. Whether or not such interdependencies signal the presence of a social norm, and what the nature of such norm might be (marriageability, honour, purity, group identity, etc.) are beyond the scope of this study.

The goal of this paper has been to present a complete and general analysis of the relation between FGM/C dynamics and the economic, social and political conditions across African countries. The data show that, overall, economic/political/social conditions of countries that do not practice FGM/C are much better than those of countries that do, and that individuals living in countries practicing FGM/C experience a lower degree of autonomy than individuals living in countries where FGM/C is absent.

When we look closely at the differences across countries that practice FGM/C, we find that there exists a weak, non-univocal relationships between economic/social/political development and the rate at which FGM/C is practiced. We also find that this rate decreases with increasing trust in institutions and active social participation. The rate of FGM/C increases with the degree of women discrimination, and it is also higher the stronger the social expectations supporting it. Finally, though many countries that practice FGM/C are prevalently Islamic, we found no strong link between Islam and female cutting. Our conclusion is that practices as traditional as FGM/C are not that sensitive to changes in fundamentals.

The case studies we report show that bottom-up approaches, aimed at changing beliefs, attitudes and/or values directly or indirectly involving FGM/C can be very effective in reducing the practice. The attempts made by AMREF in Kenya (AMREF, 2014a,b), which proposes alternative rites of passage (ARP) to eradicate FGM/C and improve health and education of girls, are a good example of such bottom-up approaches. Mass media (radio, tv and soap operas) could also be helpful in changing individual beliefs and attitudes (Bicchieri and McNally, 2015; Della Vigna and La Ferrara, 2015; La Ferrara, 2015; La Ferrara et al., 2012). If there are interdependencies, these interventions will inevitably also change social expectations, reinforcing the effects of beliefs, attitudes and/or values change.

Appendix

Table A.1 reports the countries object of the analysis, whether FGM/C is practiced in each country and, for countries that practice it, its dynamics.

Table A.2 lists the variables used in the paper, their definition, the source and the variables from which they have been obtained.

Table A.1: List of Countries

Country	FGM/C	FGM/C Dynamics	Country	FGM/C
Benin	y	Decreasing	Algeria	n
Burkina Faso	y	Increasing	Angola	n
Cameroon	y	Stable (low)	Botswana	n
Central African Republic	y	Decreasing	Burundi	n
Chad	y	Stable (high)	Cape Verde	n
Cote d'Ivoire	y	Decreasing	Comoros	n
Djibouti	y	Stable (high)	Congo, Dem. Rep.	n
Egypt	y	Stable (high)	Congo, Rep. of	n
Eritrea	y	Decreasing	Equatorial Guinea	n
Ethiopia	y	Decreasing	Gabon	n
Gambia	y	Stable (high)	Lesotho	n
Ghana	y	Stable (low)	Libya	n
Guinea	y	Stable (high)	Madagascar	n
Guinea-Bissau	y	Increasing	Malawi	n
Kenya	y	Decreasing	Mauritius	n
Liberia	y	Stable (high)	Morocco	n
Mali	y	Stable (high)	Mozambique	n
Mauritania	y	Stable (high)	Namibia	n
Niger	y	Decreasing	Rwanda	n
Nigeria	y	Increasing	Sao Tome and Principe	n
Senegal	y	Stable (low)	Seychelles	n
Sierra Leone	y	Stable (high)	South Africa	n
Somalia	y	Stable (high)	Swaziland	n
Sudan	y	Stable (high)	Tunisia	n
Tanzania	y	Decreasing	Zambia	n
Togo	y	Decreasing	Zimbabwe	n
Uganda	y	Stable (low)		

Note : y indicates that the country practices FGM/C, n that it does not practice it.

Table A.2: List of Variables, Definition and Sources

Variable	Definition	Source
circumcised	dummy variable taking value 1 if the woman is circumcised, 0 otherwise	Demographic Health Survey (DHS), variables (v.): s801, s802, s901, s902, s821, g102, fg103, v902, s1001, s1002, s1003, s229, s521, s551, s552, g102, s631f
circumcision	regional percentage of women that have been circumcised	DHS, v.: see circumcised
FGM_continue	regional percentage of women that think that FGM/C should continue	DHS, v.: fg123, g119, s830, s916, s631g, s566, s560, s1012, s1023, s816
FGM_req_rel	regional percentage of women who think that FGM/C is required by religion	DHS, v.: fg122, g118, s1022
b_Men_cont	regional percentage of women thinking that men/their husband believe that FGM/C should continue	DHS, v.: fg124, s924, s1024, s817
FGM_rate	variable taking value 0 for countries with no FGM/C, and the yearly average rate of FGM/C for countries practicing FGM/C	DHS, v.: see circumcised; UNICEF Reports (2014)
age	age of respondent (r hereafter)	DHS, v.: v012
age^2	age of r squared	DHS, v.: see age
urban	dummy variable taking value 1 if the r lives in a city, 0 otherwise	DHS, v.:v025
education	education taking values 0-3. 0 if the r has no education, 3 if the r has a higher education level	DHS, v.: v106
Islam	dummy variable taking value 1 if the r is Muslim, 0 otherwise	DHS, v.: v130
ServiceVA	service value added as percentage of GDP	World Development Indicators (WDI)
IndustryVA	industry value added as percentage of GDP	WDI
ManufactureVA	manufacture value added as percentage of GDP	WDI
AgricultureVA	agriculture value added as percentage of GDP	WDI
GDPpc	GDP per capita at constant prices in US$. Base year: 2005	WDI

Variable	Definition	Source
LiteracyYF	literacy rate of young females (percentage of females aged 15-24)	WDI
LiteracyAF	literacy rate of adult females (percentage of females aged 15 and above)	WDI
TertiaryFT	percentage of females as teachers in tertiary education	WDI
OverallFreedom	index of overall freedom as average of the ten indexes for economic freedom scaled 0-100 (100=maximum)	Heritage Foundation (HF)
FreedomCorr	index scaled 0-100 (100=maximum). The score is derived from transparency International's Corruption Perception Index (CPI), which measures the level of corruption	HF
PolRights	indicator ranging from 1 to 7, 1 represents the most free in political rights, 7 the least free	Freedom House
CivLiberties	indicator ranging from 1 to 7, 1 represents the most free in civil liberties, 7 the least free	Freedom House
Polity2	index ranging from -10 to 10. -10 indicates that the country is strongly autocratic, 10 that the country is strongly democratic	PolityIV
PolComp	index ranging from 1 to 10 (10=highest). It measures political competition	PolityIV
PhysIntegrity	index constructed from Torture, Extrajudicial killing, Political Imprisonment and Disappearance indicators. It ranges from 0 to 8. 8 means full government respect for these rights.	CIRI
EmpowerRights	index constructed from the Foreign Movement, Domestic Movement, Freedom of Speech, Freedom of Assembly and Association, Workers' Rights, Electoral Self-Determination and Freedom of Religion indicators. It ranges from 0 to 14. 14 means a full government respect for these rights.	CIRI
FreeAssociation	it ranges from 0 to 2. 2 means that the rights of citizens to assemble freely and to associate with other persons in political parties, trade unions, cultural organizations or other special interest groups were unrestricted and freely enjoyed by pratically all citizens in a given year.	CIRI
WEconRights	it ranges from 0 to 3. 3 means that all or nearly all of women's economic rights were guaranteed by law and the government fully and vigorously enforces these laws in a given year.	CIRI
WPolRights	it ranges from 0 to 3. 3 means that women's political rights were guaranteed in both law and practice in a given year.	CIRI
WSocRights	it ranges from 0 to 3. 3 means that all or near all of women's social rights were guaranteed in both law and practice in a given year.	CIRI

Variable	Definition	Source
trust	dummy variable taking value 1 if r thinks that most of people can be trusted, 0 otherwise	World Values Survey (WVS), v.: a165; Afrobarometer (Afrob.), v.: sctrust, q83, q87
trustKnown	country average based on a dummy variable taking value 1 if r thinks that most of people (s)he knows can be trusted, 0 otherwise	Afrob., v.: q84b, WVS, v.: G007_33_B
trustPresident	country average based on a dummy variable taking value 1 if r thinks the Parliament can be trusted, 0 otherwise	Afrob., v.: trspre, q43a, q55a, q49a, q59a
trustParliament	country average based on a dummy variable taking value 1 if the r thinks that the parliament can be trusted, 0 otherwise	Afrob., v.: q43b, q55b, q49b, q59b
trustPolice	country average based on a dummy variable taking value 1 if r thinks the police service can be trusted, 0 otherwise	Afrob., v.: trspol, q43b, q55h, q49g, q59h
trustCourt	country average based on a dummy variable taking value 1 if r thinks that the Court of Law can be trusted, 0 otherwise	Afrob., v.: trscts, q43j, q55i, q49h, q59j
trustElecCommiss	country average based on a dummy variable taking value 1 if r thinks that the Electoral Commission can be trusted, 0 otherwise	Afrob., v.:trsnec, q43c, q55c, q49c, q59c
trustLocalGov	country average based on a dummy variable taking value 1 if r thinks that Local Government can be trusted, 0 otherwise	Afrob., v.: q43e, q55d, q49d, q59e
trustRulParty	country average based on a dummy variable taking value 1 if r thinks that Ruling Party can be trusted, 0 otherwise	Afrob., v.: q43f, q55e, q49e, q59f
MemReligiousGr	country average based on a dummy variable taking value 1 if r is a member of a religious group, 0 otherwise	Afrob., v.: memrel, q24a, q28a, q22a, q25a
MemCommDev	country average based on a dummy variable taking value 1 if r is a member of a local self-help association, 0 otherwise	Afrob., v: memdev, q24d, q28d, q22b, q25b
AttCommMeet	country average based on a dummy variable taking value 1 if r attends meetings of a group that does things for the community, 0 otherwise	Afrob., v.: parcom, q25b, q31a, q23a,

Variable	Definition	Source
AttDemo	country average based on a dummy variable taking value 1 if r has attended a demonstration or protest march, 0 otherwise	Afrob., v.: pardem, q25d, q31c, q23c, q26d
RaiseIssue	dummy variable taking value 1 if r has participated with others to address an important problem affecting the community or nation (other than elections), 0 otherwise	Afrob., v.: pariss, q25c, q31b, q23b, q26b
ContOfficial	country average based on a dummy variable taking value 1 if r, in the past, has contactred a government or a political party official about some important problem or to give them his/her views	Afrob., v.: parctg, q29b, q29c, q32b, q32c, q25b, q25c, q30b, q30c
WTreatedUn(emp	country average based on a dummy variable taking value 1 if r thinks that women are deserved an unequal treatment by employers, 0 otherwise	Afrob., v.: q56e
WTreatedUn (courtpol)	country average based on a dummy variable taking value 1 if r thinks that women are deserved an unequal treatment by the court or the police, 0 otherwise	Afrob., v.: q56d
WTreatedUn (leader)	country average based on a dummy variable taking value 1 if r thinks that women are deserved an unequal treatment by a leader, 0 otherwise	Afrob., v.: q56c
EmpowerW	dummy variable taking value 1 if r thinks that the present government is handling well with empowering of women, 0 otherwise	Afrob., v.: q67, q57p, q65p
EthnicFract	index of ethnic fractionalization	Alesina et al., 2003
autonomy	dummy variable taking value 1 if r's control on her/his own life is 6 or more on a sclae of 10, 0 otherwise	WVS, v.: a173
localComm	dummy variable taking value 1 if the r declares (s)he feels to be citizen of a local community, 0 otherwise	WVS, v.: G020
age	age of r	WVS, v.: X003
	age of r squared	WVS, v.: see age
worldCitizen	dummy variable taking value 1 if the r declares (s)he feels to be citizen of the world, 0 otherwise	WVS, v.: G019
trustOtherN	dummy variable taking value 1 if the r declares (s)he trust individuals from other nations, 0 otherwise	WVS, v.: G007_36_B
trustOtherR	dummy variable taking value 1 if the r declares (s)he trust individuals from other religions, 0 otherwise	WVS, v.: G007_35_B
eudH	dummy variable taking value 1 if r has tertiary level education, 0 otherwise	WVS, v.: X025
eudL	dummy variable taking value 1 if r has at most some degree of compulsory education, 0 otherwise	WVS, v.: X025

Variable	Definition	Source
gender	dummy variable taking value 1 if r is female, 0 otherwise	WVS, v.: X001
single	dummy variable taking value 1 if r is single or never married, 0 otherwise	WVS, v.: X007
married	dummy variable taking value 1 if r is married or living together, 0 otherwise	WVS, v.: X007
child	dummy variable taking value 1 if r has children, 0 otherwise	WVS, v.: X011
CitySize	dummy variable taking value 1 if r is living in a city with more than 100,000 inhabitants, 0 otherwise	WVS, v.: X049
ft	dummy variable taking value 1 if r is working full-time, 0 otherwise	WVS, v.: X028
pt	dummy variable taking value 1 if r is working part-time, 0 otherwise	WVS, v.: X028
self-empl	dummy variable taking value 1 if r is self-employed, 0 otherwise	WVS, v.: X028
fgm	dummy variable taking value 1 if the country r is living in practice FGM/C, 0 otherwise	UNICEF reports, 2013 and 2014

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